

IAQ89

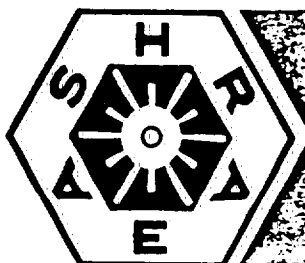
Indoor Air Quality
April 17-20, 1989
San Diego, CA

The Human Equation: Health and Comfort

Organized by the
**American Society of Heating,
Refrigerating and Air-Conditioning
Engineers, Inc.**
and the
Society for Occupational and Environmental Health

IAQ89 Manufacturers' Product and Service Session

2023379807



IAQ 89 THE HUMAN EQUATION: HEALTH AND COMFORT

Welcome to IAQ '89

This year's conference has been organized by:

The American Society of Heating, Refrigerating and
Air-Conditioning Engineers, Inc.
and

The Society for Occupational and Environmental Health.

IAQ '89 is a follow up symposium to IAQ 86, 87 and 88, and
will present demonstrated, documented solutions to indoor air
quality problems.

IAQ '89 Steering Committee

H. E. "Barney" Burroughs, Chairman
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Financial Contributors:

U.S. Department of Energy
U.S. Environmental Protection Agency
National Institute for Occupational Safety and Health
National Heart, Lung and Blood Institute
National Institute of Environmental Health Sciences

UPCOMING ASHRAE MEETINGS

Winter	Date	Annual
	1989	Vancouver, BC June 24-28
Atlanta, GA Feb 10-14	1990	St. Louis, MO June 9-13
New York, NY Jan 19-23	1991	Indianapolis, IN June 22-26
Anaheim, CA Jan 25-29	1992	Baltimore, MD June 27-July 1

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ASHRAE/SOEH IAQ'89 PROGRAM

MONDAY, APRIL 17

8:30 a.m. to 8:45 a.m.

OPENING REMARKS

Aviary Ballroom

H.E. "Barney" Burroughs, *IAQ'89 Chairman*
David S. Butler, *ASHRAE President-Elect*
James A. Merchant, M.D., *SOEH Past President*

8:45 a.m. to 10:45 a.m.

PANEL DISCUSSION:

GOVERNMENT ACTIVITIES IN INDOOR AIR QUALITY

Aviary Ballroom

James A. Merchant, M.D., *Panel Chairman*

PANELISTS:

Sandra Eberle, *US Consumer Products Safety Commission*
Richard W. Gorman, *National Institute for Occupational
Safety and Health*
James E. Hill, Ph.D., *National Institute of Standards and
Technology* John Talbot
George S. Malindzak, Ph.D., *National Institute of En-
vironmental Health Services*
David H. Mudarri, Ph.D., *US Environmental Protection
Agency*
Susan L. Rose, Ph.D., *US Department of Energy*

10:45 a.m. to 11:00 a.m. **BREAK**
Foyer

11:00 a.m. to 12:30 p.m.

TECHNICAL SESSION:

POLLUTANTS/HEALTH EFFECTS

Aviary Ballroom

Dean Baker, M.D., *Session Chairman*

Sick Building Syndrome Traced to Excessive Total Suspended Particulates (TSP):

C. W. Armstrong, M.D., F.A.C.P.
P. C. Sherertz, Ph.D.
G. C. Llewellyn, Ph.D., *Virginia Department of Health, Rich-
mond, Virginia*

An epidemiologic and environmental investigation into the air quality of a high-rise, public office building was conducted in July, 1988. A walk-through inspection revealed particulate (dust) soiling of ceiling and work surfaces, in occupied sections of the service floor. Building air samples obtained by high-volume air pumps and cassette filters revealed elevated concentrations of total suspended particulates (TSP) which ranged up to 1.07 mg/m³ (over 17 times the Building Officials and Code Administrators (BOCA) standard). In 17 (59%) of the 29 areas tested, TSP levels exceeded the BOCA standard of ≤ 0.06 mg/m³ (annual average). Recorded temperatures, relative humidity readings, and supply of outside air were within acceptable limits. Testing for volatile organic compounds, combustion products, formaldehyde, ozone, and fungal spores revealed no levels of concern. A survey of occupants in selected units was conducted with 94% participation. Fifty-five percent indicated that they had experienced symptoms that appeared or worsened during their working hours. Of these, 47% indicated that they had missed work because of their symp-

toms. Common symptoms were headache and sinus/upper respiratory congestion, compatible with air contamination by TSP or other irritants. In multivariate analysis, illness was found to be significantly associated with air TSP concentration ($p < 0.002$), CO₂ concentration, average number of hours worked per week, gender, and smoking status. This is one of very few outbreaks of building-related illness where occupant illness has been associated with exposure to elevated levels of an environmental contaminant (TSP).

Symptoms and the Micro-Environment in the Sick-Building Syndrome: A Cross-Sectional Investigation:

LMJ. Hodgson, M.D., M.P.H., *University of Pittsburgh School
of Medicine, Pittsburgh, PA*
P. Collopy, M.E., C.I.H., *Carnegie Mellon University,
Pittsburgh, PA*

In a cross-sectional investigation in one building, complaints associated with the "sick building syndrome" were measured on a linear analogue scale questionnaire. At the same time, the micro-environment was characterized in the breathing zone by measuring temperature, relative humidity, respirable suspended particulates. Regression models suggested that heat load may have contributed to the level of complaints.

Health Effects of Heating With Wood: Chest Illness in Young Children and Indoor Heating With Woodburning Stoves:

J. S. Osborne, III, Ph.D., M.P.H., *Southwestern Michigan Area
Health Education Center, Kalamazoo, Michigan*
R. E. Honick, M.D., *Michigan State University College of
Human Medicine, East Lansing, Michigan*

This study investigated a suspected relationship between the occurrence of chest illness in young children and use of woodburning stoves (WBS) for indoor heating. Data were prospectively collected during the winters of 1980, 1981, and 1982 for 62 mid-Michigan children age one to seven years (31 randomly selected children from WBS-heated homes and 31 controls from homes heated by conventional sources matched for age, sex, and place of residence). The specific a priori research hypothesis were that the proportion of children having a chest illness would be significantly greater in the WBS-group than in the control group, that a greater proportion of WBS-group children would have chest illnesses lasting at least one week, and that a greater proportion of WBS-group children would be hospitalized before age two years for chest illness.

Results showed a significant difference ($p < 0.05$) between the WBS and control groups in the proportion of children having a chest illness from 1980-82 (especially bronchitis, upper respiratory infection, and pneumonia); 39% of the WBS-group and 19% of controls had at least one such illness. Further, the WBS-group had a greater proportion of chest illnesses lasting at least one week (32% vs. 16%) and a greater proportion of hospitalizations for chest illness before age two years (16% vs. 10%). These differences were not accounted for by medical histories, frequency of physician visits, sociodemographic factors, or exposure to other sources of indoor air pollution investigated in the study (i.e., parental smoking, cooking with gas, urea-formaldehyde foam insulation) and suggest that indoor heating with WBS may be a significant risk factor for chest illness in young children.

The Effects of Environmental Tobacco Smoke on Acute Respiratory Disease:

B. D. Ostro, Ph.D., *California Public Health Foundation,
Berkeley, California*

There are few sources of data that provide individual-level estimates of smoking status, as well as information on exposure